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July 25, 2003

Commissioner of Patents and Trademarks
Alexandria, VA 22313-1450

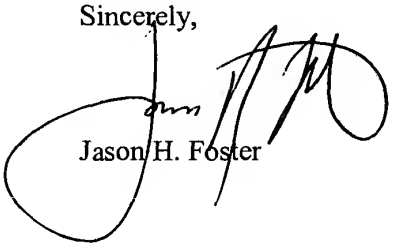
Re: Disclosure Document

Dear Sirs:

The subject matter of the patent application enclosed herewith is related to the contents of the below-identified Disclosure Document and it is requested that the Disclosure Document be retained by the U.S. Patent and Trademark Office in the file for the enclosed patent application.

Disclosure Document No.: 509930
Filed: April 15, 2002
For: Wound Regenerator Fabrication Methods

Sincerely,



Jason H. Foster

JHF/cg
Enclosure: Disclosure Document

1. Indexed Foil Regenerator

Date: 3/14/02

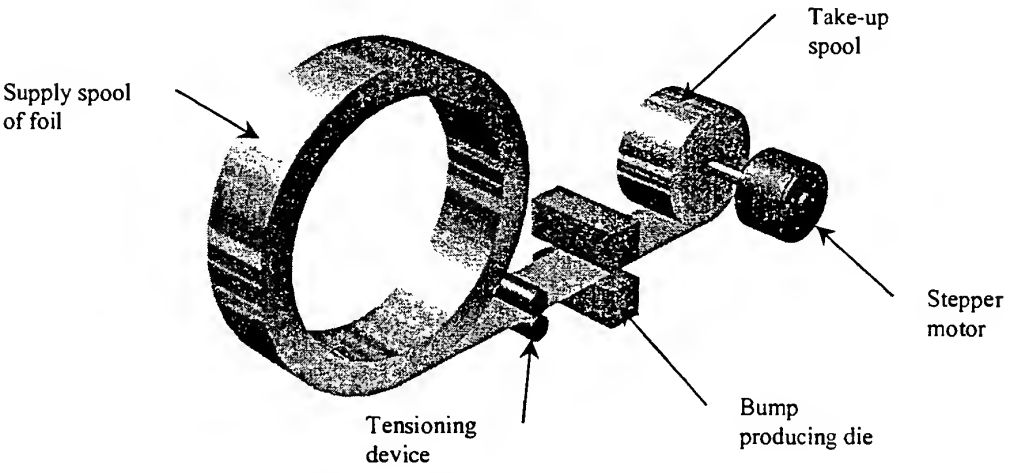
Inventors: Todd Cale

Description:
The following method of producing a wound foil regenerator prevents nesting of the bumps commonly used in a foil type regenerator. Instead of the bumps having an equal distance between them the spacing is adjusted to give an equal number of bumps per layer. Each layer is given an offset, positive or negative, to prevent nesting.
One simple way of accomplishing this is by using a stepper motor on the take-up spool of the winding device.

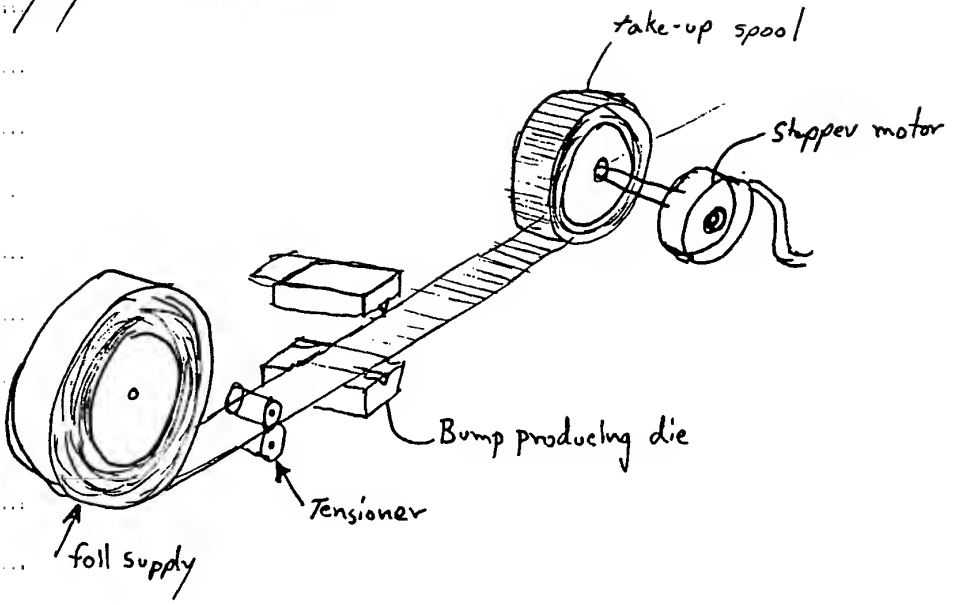
Sample **Process** (assuming foil is already installed in winding device)

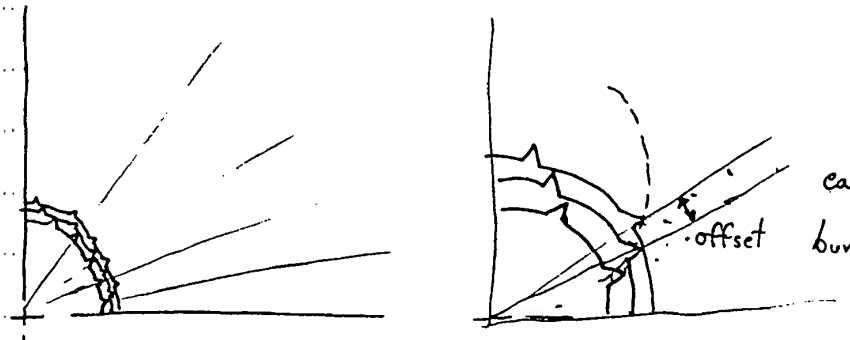
1. Bump producing die produces a bump.
2. Stepper motor winds foil x degrees.
3. A bump is produced.
4. Steps 2 and 3 repeat until the motor has rotated 360-x degrees.
5. The next bump will be the first bump on the second layer. So the stepper motor rotates x degrees plus an offset. The offset prevents nesting from occurring.

Note that the offset only occurs at the first bump of each layer and may be positive or negative.



3/19/02 Todd Cole





each layer offset to miss previous bumps

Process

1.) stepper motor indexes X° and stops
2.) bump producing die produces bump
3.) steps 1 and 2 repeat until stepper motor has rotated 360°-X°, then stepper motor rotates X°+offset°
4.) produce bump
5.) repeat for each layer required

Witnessed:
Read & Understood
[illegible] Wood
3/19/02

2. Wire Spaced Foil Regenerator

Date: 3/14/02

Inventors: Todd Cale

Description:
To improve the uniformity of the gaps between layers in a wound foil regenerator, using dimples or spring tabs, wires with a diameter equal to the desired gap are introduced into the take-up spool near the edges of the foil. The wires together with the foil produce an incompressible or solid condition near each end. This solid condition reduces the sensitivity to the amount of tension applied during winding. When the winding is finished and the end of the foil is attached, the spacing wires are removed from the ends. Note that without the spacing wires, using dimples or spring tabs which are compressible, the spacing is very sensitive to the tension applied while winding.